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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/897,803	07/02/2001	John William Harper	STL920000104US1	2493

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EXAMINER

CHEN, CHONGSHAN

ART UNIT	PAPER NUMBER
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2162

DATE MAILED: 10/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/897,803	<b>Applicant(s)</b> HARPER ET AL.	
	<b>Examiner</b> Chongshan Chen	<b>Art Unit</b> 2172	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 June 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 9-17 and 24 is/are rejected.
- 7) ☒ Claim(s) 7, 8 and 18-23 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>7/17/2004</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. This action is responsive to Amendment filed on 17 June 2004. Claims 1-24 are pending in this Office Action.

#### ***Claim Objections***

2. Claims 1 and 6 are objected to because the applicants claim two different processes, random sampling and replication in the claims. It is unclear how the replication is related to the random sampling.

#### ***Response to Arguments***

3. Applicant's arguments filed on 17 June 2004 have been fully considered but they are not persuasive.

4. As per applicant's arguments regarding Shatdal does not teach a random sampling facility integrated into a database management system have been considered but are not persuasive. Shatdal discloses the sampling is incorporated in a parallel database system (Shatdal, col. 1, lines 66-67). Clearly, the sampling facility is not only integrated with database processing, but also integrated in the database system. Since the sampling is integrated with the database system, it is obvious that the sampling facility has access to low level functions and buffers of the database management system. Because during the execution, the random sampling facility will call low level functions to fetch random samples and store the samples in the memory buffers of the database management system for process.

*Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wahl et al. ("Wahl", US 6,324,654 B1) in view of Shatdal (US 6,564,221 B1).

As per claim 1, Wahl teaches a method for administration and replication of a database, comprising the step of:

performing a replication on said database (Wahl, col. 24, lines 8-23).

Wahl does not explicitly disclose providing a database management system with a built-in random sampling facility configured as an integral part of said database management system, whereby the random sampling facility has access to low level functions and buffers of the database management system; and executing said random sampling facility from within the database management system. Shatdal discloses a random sampling facility is incorporated in a

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database system, and executing said random sampling facility (Wahl, col. 1, lines 66-67, col. 2, lines 35-36). Since the sampling is integrated with the database system, it is obvious that the sampling facility has access to low level functions and buffers of the database management system. Because during the execution, the random sampling facility will call low level functions to fetch random samples and store the samples in the memory buffers of the database management system for process. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a built-in random sampling facility in the system of Wahl in order to random sampling data.

As per claim 15, Wahl discloses a database management system (DBMS) for managing an associated database, the DBMS comprising:

database replication tools (Wahl, col. 24, lines 8-23).

Wahl does not explicitly disclose random sampling facility; first database analysis tools using said integrated random sampling facility for generating extrapolated reports on database content; second database analysis tools using said integrated random sampling facility for generating extrapolated reports on database size. However, Wahl discloses replicate the database according its partition (Wahl, col. 24, lines 8-23). Furthermore, applicants discloses in the specification that using random sampling analyze database partition is known in the art (specification, page 1-2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a random sampling to generate extrapolated reports on database content and size in order to determine database partition.

The applicants disclosed random sampling facility is not built-in the database management system. Shatdal discloses a random sampling facility is incorporated in a database

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system, and executing said random sampling facility (Wahl, col. 1, lines 66-67, col. 2, lines 35-36). Since the sampling is integrated with the database system, it is obvious that the sampling facility has access to low level functions and buffers of the database management system.

Because during the execution, the random sampling facility will call low level functions to fetch random samples and store the samples in the memory buffers of the database management system for process. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to integrate the random sampling facility into the database management system. Integrating the random sampling facility into the database management system will reduce function calls between the random sampling facility and the database management system. This will improve processing speed.

8. Claims 2-6, 9-14, 16-17 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wahl et al. ("Wahl", US 6,324,654 B1) in view of Shatdal (US 6,564,221 B1) and further in view of Hogg and Craig ("Hogg", "Introduction to Mathematical Statistics", 5<sup>th</sup> ed.).

As per claim 2, Wahl and Shatdal teach all the claimed subject matters as discussed in claim 1, except for explicitly disclosing defining a database record sample size S; randomly sampling S records of the database using said random sampling facility; storing statistics for each of said S records, wherein said statistics include a record key for each record; and producing an extrapolated replication partition analysis based on said statistics. Hogg discloses a random sampling algorithm that defining a database record sample size S; randomly sampling S records of the database using said random sampling facility; storing statistics for each of said S records, wherein said statistics include a record key for each record (Hogg, page 123). Furthermore, Applicants disclose using random sampling to analyze database partition is known in the art

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(specification, page 1-2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the random sampling algorithm of Hogg to produce an extrapolated replication partition analysis in order to determine the database partition in order to determine the database partition size.

As per claim 3, Wahl, Shatdal and Hogg teach all the claimed subject matters as discussed in claim 2, and further disclose defining a default sample size; selectively receiving a desired sample size; and, setting said sample size S as said default sample size when the desired sample size is not selectively received, and setting said sample size S as said desired sample size when the desired sample size is selectively received (Hogg, page 123).

As per claim 4, Wahl and Shatdal teach all the claimed subject matters as discussed in claim 1, except for explicitly disclosing defining a database record sample size S; randomly sampling S records of the database using said random sampling facility; storing statistics for each of said S records, wherein said statistics include a record key for each record; and producing an extrapolated replication partition analysis based on said statistics. Hogg discloses a random sampling algorithm that defining a database record sample size S; randomly sampling S records of the database using said random sampling facility; storing statistics for each of said S records, wherein said statistics include a record key for each record (Hogg, page 123). Furthermore, Applicants disclose using random sampling to analyze database partition is known in the art (specification, page 1-2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the random sampling algorithm of Hogg to produce a partial replication analysis in order to determine the database partition in order to determine the database partition size.

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As per claim 5, Wahl, Shatdal and Hogg teach all the claimed subject matters as discussed in claim 4, and further discloses defining a default sample size; selectively receiving a desired sample size; and setting said sample size S as said default sample size when the desired sample size is not selectively received, and setting said sample size S as said desired sample size when the desired sample size is selectively received (Hogg, page 123).

Claim 6 is rejected on grounds corresponding to the reasons given above for claims 1-5.

As per claim 9, Wahl, Shatdal and Hogg teach all the claimed subject matters as discussed in claim 6, and further disclose sorting said stored statistics by key prior to producing said partition analysis (Hogg, page 123).

As per claim 10, Wahl, Shatdal and Hogg teach all the claimed subject matters as discussed in claim 9, and further disclose accessing all database records in an arbitrary sequence; iteratively filling all of said partitions except the last said partition with said accessed records to a maximum byte count; and, storing remaining accessed records in the last of said partitions (Hogg, page 123).

As per claim 11, Wahl, Shatdal and Hogg teach all the claimed subject matters as discussed in claim 6, and further disclose storing statistics includes storing said statistics in a memory (Hogg, page 123).

As per claim 12, Wahl, Shatdal and Hogg teach all the claimed subject matters as discussed in claim 11, except for explicitly disclosing storing said statistics in said memory in a compressed format. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to store said statistics in said memory in a compressed format in order to save storage space. Therefore, it would have been obvious to one of ordinary skill in the

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art at the time the invention was made to store said statistics in said memory in a compressed format in order to save storage space.

As per claim 13, Wahl, Shatdal and Hogg teach all the claimed subject matters as discussed in claim 6, except for explicitly disclosing defining multiple partition boundaries. However, Wahl discloses maintaining the database partition during replication. It is obvious that the replication process of Wahl defines multiple partition boundaries so that the partition of database can be maintained during replication.

As per claim 14, Wahl, Shatdal and Hogg teach all the claimed subject matters as discussed in claim 6, except for explicitly disclosing at least one index dataspace; at least one key dataspace; and at least one statistics dataspace. However, it is well known in the art the random sampling utilizes dataspace.

Claim 16 is rejected on grounds corresponding to the reasons given above for claims 1-5.

As per claim 17, Wahl, Shatdal and Hogg teach all the claimed subject matters as discussed in claim 16, and further disclose a means for sorting stored statistics by key prior to producing at least one of said analyses (Hogg, page 123).

Claim 24 is rejected on grounds corresponding to the reasons given above for claim 14.

***Allowable Subject Matter***

9. Claims 7-8 and 18-23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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The prior art of record, alone or combination, does not teach or fairly suggest the steps with in combination of elements as recited in claim 7 “generating a table of S number pairs ( $Y_j$ ,  $I_j$ ),  $j=1,2, \dots, S$ , wherein all Y and all I are initially set to zero; initializing a reservoir of records to an empty state; setting an index M to said reservoir equal to zero; generating a sequence of N non-repeating random numbers  $U_1, U_2, \dots, U_n$ ,  $0 \leq U \leq 1$ , wherein N is the number of records in the database; and, performing additional steps for each random number  $U_k$  generated,  $k=1,2, \dots, N$ , the additional steps including: skipping the next record in the database if  $U_k$  is less than the smallest value of Y in said table of number pairs; and, updating the table if a Y less than  $U_k$  exists by performing further steps including: setting M equal to its current value plus one; replacing the smallest Y in the table with  $U_k$ ; setting the I value paired with the smallest Y equal to M; and, storing all or part of the next record of the database in said reservoir of stored records, wherein the current value of M is a reservoir index to said stored record”.

The prior art of record, alone or combination, does not teach or fairly suggest the steps with in combination of elements as recited in claim 18 “means for generating a table of S number pairs ( $Y_j$ ,  $I_j$ ),  $j=1,2, \dots, S$ , wherein all Y and all I are initially zero; a means for initializing a reservoir of records to an empty state; a means for setting an index M to said reservoir equal to zero; a means for generating a sequence of N non-repeating random numbers  $U_1, U_2, \dots, U_n$ ,  $0 \leq U \leq 1$ , wherein N is the number of records in the database; and, a means, for each random number  $U_k$  generated,  $k=1,2, \dots, N$ , comprising: a means to skip the next record in said database if  $U_k$  is less than the smallest value of Y in said table of number pairs; and, a means to update the table if a Y less than  $U_k$  exists, comprising: a means to set M equal to its current value plus one; a means to replace the smallest Y in the table with  $U_k$ ; a means to set the I value paired

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with the smallest Y equal to M; and, a means to store all or part of the next record of said database in said reservoir of stored records, wherein the current value of M is a reservoir index to said stored record”.

### ***Conclusion***

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chongshan Chen whose telephone number is (703) 305-8319.

As of October 21, 2004, new number should be (571) 272-4031. The examiner can normally be reached on Monday-Friday 8:00 A.M. - 4:00 P.M..

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E Breene can be reached on (703) 305-9790.

As of October 21, 2004, new number should be (571) 272-4107.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

September 30, 2004



SHAHID ALAM  
PRIMARY EXAMINER